

Coloration brown, without traces of spots. The total length of the largest examined specimen 170 millims.

I possess two specimens from the western and northern coasts of Norway, both brought up in a dredge by Prof. G. O. Sars searching for sea animals. The larger specimen (total length 170 millims.) was taken at Florö, on the Bergen coast, in 1873; the other is a younger individual (total length 100 millims.), and taken from a depth of 30 fathoms at Bodö, north of the Arctic Circle (lat. 67° 15' N.), in 1874.

Christiania, November 10, 1874.

### MISCELLANEOUS.

#### *On the Embryogeny of the Rhizocephala.*

*To the Editors of the Annals and Magazine of Natural History.*

GENTLEMEN,—In your Journal for November 1874, p. 383, M. Giard imputes an error to me of which I am not guilty. He says:—"An error similar to that of M. Gerbe has been made by Professor Semper, who describes as furnishing a larva of a *very* peculiar form a *Peltoaster* of the Philippine Islands, of which he has *evidently* observed the embryos only after the first moults, when they already affected the Cypridine form."

I trust you will be so kind as to allow me to offer some remarks on this matter.

Having observed the Cypridine larva of a *Peltoaster* in the Pelews already in 1861, and having sent my few remarks on them to the editor of the 'Zeitschr. für wiss. Zool.' in 1862, which appeared in 1863, I was evidently unable to know that F. Müller would describe in the year 1863 (Arch. f. Naturgesch. xxix. Febr.) the second larva of the Suctoria: at that period only the first of them, the *Nauplius*-form, was known. I was thoroughly justified, therefore, in designating a larva diverging from the only known ones as being *peculiar*; I might then have called it rightly *very* peculiar, although I have not done so. It was peculiar not only for its unknown form, but also for its two eyes, whilst the larvæ of *Rhizocephala* till then known had only a single one.

M. Giard imputes to me an error on the ground of his belief that all *Rhizocephala* *must* have a *Nauplius*-larva as the first larval stage. But this is only a dogma. M. Giard has not examined the species discovered by me in the Pacific; he has therefore no formal right to impute to me a mistake in my observations. In the totally closed sac of the mother only such Cypridine larvæ were found, no *Nauplius*-larvæ or empty skins which I might have ascribed to such. Why, then, should not here, as is the case with so many other crustaceans,

the development of one species have been shortened? M. Giard communicates no observations which might prove the impossibility of such a shortening of the development. Consequently I maintain my view that the species described since by Dr. Russmann under the name of *Thompsonia globosa* (Verhandl. d. phys.-med. Gesellsch. zu Würzburg, 1872, oder Arbeiten aus dem zoologisch-zootomischen Institut zu Würzburg, Band i. p. 131), after my drawings and specimens, has larvæ which leave the egg only in the Cypridine form. There is even no stringent reason to take it for granted, as M. Giard not very judiciously seems to do, that they undergo a conspicuous change of form within the egg, although this, of course, remains to be ascertained.

Yours very truly,

Würzburg, November 20, 1874.

Prof. C. SEMPER.

*On the Circulatory Apparatus of the Echinida.* By M. E. PERRIER.

The circulatory apparatus of the Sea-Urchins has been the subject of numerous investigations, which are summarized in Valentin's monograph on *Echinus lividus*, and more recently in the fine monograph of the Echinida by Mr. Alexander Agassiz. These various researches have left very doubtful even the most important points in the arrangement of the vascular apparatus. We can regard as certain only these two facts :—1. The existence of an intestinal vascular apparatus. 2. The existence of a system of vessels communicating with the ambulacral canals, and usually designated by the name of the aquiferous apparatus. We did not even know whether these two systems of vessels were distinct, or whether they communicated with each other. This communication, imperfectly seen by Louis Agassiz, and since sought in vain by many anatomists, has only been met with again quite recently by Hoffmann in the *Spatangi* and *Toxopneustes*, belonging to the regular Echinida. But there were still many questions to be solved :—The mode of vascularization of the test indicated by some authors seemed very doubtful. The structure of the heart, or at least of the organ so called by anatomists, remained very obscure ; moreover there was occasion, in the presence of contradictory statements, to verify the announced results, to group and coordinate, and finally to present a complete and homogeneous description of the circulatory apparatus of the Echinida.

This is the problem which I have endeavoured to solve during a stay of several weeks at the laboratory of experimental zoology of M. de Lacaze-Duthiers at Roscoff (Finisterre).

The dredging-operations instituted by M. de Lacaze-Duthiers at his laboratory brought in every day with certainty a great number of specimens of *Echinus sphæra*, which, in consequence of their considerable size, were particularly well adapted for my investigations, the results of which may be summarized as follows :—

Beneath the madreporic plate a canal (the sand-canal) originates, which descends vertically towards the lantern, passing along the œsophagus to the left and behind. This vessel and the œsophagus are united by a mesenteric lamina which embraces the organ hitherto known